End-of-the-year Report

Contract Yk-88-89-016

RECONNAISSANCE
OF M1, M2 AND QULIK 1 CLAIMS
CHANTREY INLET, NWT

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EGS 1989-3 Reconnaissance of M1, M2 and QULIK 1 Claims, Chantrey Inlet, NWT
part of NTS 56 M/6
by P. Cerny, M.A. Wise, and P. Tomascak
1 text, 16 p.
Price: $0.90.

INTRODUCTION

A reconnaissance study was carried out on the areas staked by Megagem, Inc. as the M1, M2 and Qulik 1 claims, on the eastern shore of Chantrey Inlet, N.W.T. The study was financed by contracts from the Geology Office, INAC Yellowknife and Indian Minerals West, Calgary.

The study was performed between July 31 and August 19, 1988. However, a substantial part of this time was lost due to adverse weather conditions. Actual time in field amounted to 8 days, which prevented us from examining areas of potential interest outside the claim properties.

This report is based on field observations and is restricted to geological observations. Any comments on economic aspects of individual commodities should be taken in a purely qualitative sense. Studies of economic feasibility and marketing should be conducted in the future by appropriate professionals, if development of one or more commodities is contemplated.

Very few official names of geographic features are available in the local areas examined here. For the purpose of communication in this report, geographic and geological names are used as shown in Fig. 47.

Shortage of funds and backlog of material to be analyzed in our departmental geochemical laboratory prevented finishing the analytical program before the March 31/89 deadline. This work is continuing, and its results will be interpreted and incorporated into the present report at a later date.

Figures 1 to 46 referred to in this report are those included in the report submitted in the fall 1988. To reduce the cost of report preparation, these photographs are not included here; the reader should consult the above mentioned interim report.

LOCATION AND GENERAL GEOLOGY

The properties investigated here are located on the eastern shore of Chantrey Inlet, N.W.T. The M1 and M2 claims are at 67°39'N/95°33'W, 11 km southeast of Cape Barclay. The Qulik 1 claim covers an island, locally known as Glass Island, in a constricted part of Chantrey Inlet east of Victoria Headland and south of Backhouse Point; it is located at 67°18'N/95°22'W.

The country east of the eastern shoreline of Chantrey Inlet is underlain by Archean (?) metadioritic basement hosting three greenstone belts: Chantrey in the south, Barclay, and Hay in the north (Fritsch et al. 1984). Chantrey belt is best exposed and mapped in detail; Barclay belt is poorly exposed, and Hay belt is known only from a very limited outcrop on the shoreline (Fig. 47).

Stratigraphy, lithology and structure of the Chantrey belt were described by Fritsch et al. (1984) in detail, whereas the Barclay belt was only briefly examined.

The M1 and M2 claims are located on the near-shore exposure of the Barclay belt, whereas the Qulik 1 claim covers a unit of the Chantrey belt.

THE BARCLAY BELT

The Barclay belt extends at least 60 km to the northeast (Fig. 47), and attains a maximum width of 5 km (Fritsch et al. 1984).

Regional lithologies

Within the limits of the near-shore exposure, the Barclay greenstone belt consists of dominantly subvertically dipping, northeast striking metavolcanic rocks, metapelites (with andalusite, cordierite, staurolite), chlorite schists grading into garnet-rich silicate ironstones, with limited

quartz-eye schist, amphibolite, magnetite-bearing iron formation, marble, quartzite and metaconglomerate.

Late intrusions

Two granitic intrusions are observed in Barclay belt (Fig. 48).

The Orange granite in the north is a medium-grained leucogranite with abundant patches of pegmatitic texture, in part veined by fracture-filling pegmatite dikes (Fig. 36). Its contacts are covered by overburden, except the southeastern margin which seems to be faulted against micaschists. No rare-element minerals were observed in this intrusion.

The Southeastern granite is largely composed of the pegmatitic leucogranite facies of fertile intrusions generating rare-element pegmatites (Fig. 6-8) (Cerný et al. 1981; Meintzer, 1987; Cerný and Meintzer, 1988). Layers of medium-grained leucogranite and sodic aplite are very exceptional. Pods of potassic pegmatite containing garnet, quasi-graphic garnet + quartz intergrowths, and beryl are present mainly on Beryl Island and the peninsula south of Camp Alex (Fig. 10, 11). The two intrusions marked on Fig. 48 are relatively homogeneous and continuous bodies. To the southwest, in the vicinity of Camp Alex and on the nearby islands, the Southeastern granite forms dikes cross-cutting regional foliation (Fig. 1, 12). However, an early generation of the leucogranite is also present, constituting sill-like intrusions parallel to foliation and extensively mylonitized (Fig. 4,5).

Compositional data are shown in Table 1 for 4 rock types:

CSITE-A sheared pegmatitic leucogranite,

CSITE-B metadiorite,

CBGR-1 orange granite, and

CIGR-3 coarse-grained leucogranite from an island sse of Camp Alex.

The Orange granite and pegmatitic plus coarse-grained leucogranites show typical features of fertile granites generating rare-element pegmatites (Cerný and Meintzer 1988): relatively high Si, Al and low Ti, Fe, Mg, Ca; reduced Zr and Sr but elevated Rb, Nb, and Y. However, the overall degree of rare-alkali fractionation is low, which corresponds to the relatively primitive nature of the pegmatite population associated with these granites.

Pegmatites

Pegmatites are found in three areas: immediately northwest of Camp Alex, approximately halfway between Camp Alex and Columbite Bay, and in a swarm trending northeast from Columbite Bay (Fig. 48,49).

Subvertical pegmatites adjacent to Camp Alex site (Fig. 13) are relatively simple, in part transitional from the pegmatitic leucogranite to the southeast. Garnet and beryl are seemingly the only accessory minerals; muscovite is very subordinate, and medium-grained albite occurs locally in the central parts marked by quartz pods (Fig. 14).

Pegmatites between Camp Alex and Columbite Bay are sparse. They contain cleavelandite, and one of them some beryl. The northeastern pair of pegmatites resembles those in the northeastern extremity of the third swarm.

The pegmatite swarm extending northeast of Columbite Bay is the most populated and mineralized one. The pegmatites are subvertical, essentially parallel to the foliation of the host schists, and discordance can be established only locally (Fig. 19). Internal structure ranges from homogeneous in the northeastern primitive types, through local development of blocky pods in the interior (Fig. 21, 23, 24), to distinct zoning (Fig. 20). Exomorphic tourmalinization is rare (Fig. 23).

Beryl is found in most pegmatites except those in extreme northeast; garnet is uncommon but muscovite is found in several generations, cleave-

landite is widespread (Fig. 18), and columbite plus some radioavtive minerals resembling monazite or zircon (Fig. 17) were found in the pegmatite centered on the shoreline of Columbite Bay (Fig. 16). Weathered triphylite (Fig. 24) and other (probable) phosphates were found in the pegmatite separated from others along the southern shoreline of Garnet Point, east of Columbite Bay.

Quartz veins

Quartz veins of variable strike but generally subvertical dip crosscut the foliation of metamorphic rocks southeast of Camp Alex and to the east of Garnet Point. Some of them carry columnar tourmaline along contact (Fig. 25, 26). Others tend to develop vugs lined with quartz crystals and occasionally filled with carbonates. Large cleavage fragments of what seems to be pale-green plagioclase were found in loose broken-up material; in one case this mineral was found in situ, associated with muscovitized andalusite.

CHANTREY GREENSTONE BELT

The Chantry belt extends about 175 km to the northeast from the eastern shoreline of the Inlet, and also continues to the southwest (Fig. 47). It attains maximum width of 5 km (Fritsch et al. 1984).

This belt was visited only on the Glass Island (covered by the Qulik 1 claim; Fig. 37) which consist of only one rock type.

Quartzite

Purplish quartzite, coloured probably by finely dispersed hematite, constitutes Glass Island (Fig. 38). No other metamorphic rock types were encountered, except very few streaks of phyllitic schist along the south-eastern shoreline.

Pegmatites

Pegmatite dikes roughly conformable with the northeastern strike and subvertical dip of the quartzites are encountered in the central and southeastern parts of the Island (Fig. 39). No accessory minerals were found in these pegmatites, over and above feldspars, quartz and muscovite.

Quartz veins

Quartz veins of highly variable attitudes, attaining 65 cm in width, are abundant along the steep cliffs over the northwestern shoreline of the island (Fig. 42), and under the sedimentary overburden of the northeastern extremity of the island (Fig. 40). They are rare to absent elsewhere on the island.

The veins have in most cases a cross-columnar texture; quartz is largely milky (Fig. 43, 44) but in cavities it shows clear overgrowths on euhedral crystals. Fibrous aggregates of hematite are rarely found on the quartz crystals.

ORE MINERALS, INDUSTRIAL MINERALS AND COLLECTIBLES

The abundance, quality and potential uses of the different commodities available on the M1, M2 and Qulik 1 claims (plus their broader vicinity, where applicable) will be commented on here.

Beryl

Large crystals of beryl are sparsely scattered in potassic pegmatite pods of the pegmatitic leucogranites at Camp Alex. They are somewhat more abundant in the pegmatite swarm northeast of Columbite Bay, but considerably variable in size.

Beryl is only very exceptionally of gem quality; gem-stock typical of

miarolitic pegmatites (California, Brazil, Namibia, Afghanistan, Pakistan) cannot be expected at Chantrey Inlet.

Beryl is suitable as a collectible and souvenir material.

Garnet

Small euhedral crystals, and larger (to 5 cm) garnet + quartz intergrowths are found mainly at Camp Alex, associated with beryl in potassic pods of the pegmatitic leucogranites.

Garnet is very abundant in the silicic ironstones at Garnet Point. Weathered schists offer limited quantities of collectible material with well-exposed subhedral to euhedral garnet crystals (Fig. 31). Garnet-rich schists can provide virtually unlimited material for cut-and-polished souvenir material.

Columbite-tantalite and radioactive minerals

So far, the minerals were found in insignificant amounts in a single pegmatite.

Triphylite

Triphylite and other (probable) phosphates may amount to a very limited supply of collectibles. However, their main significance is in their geochemical indication of a Li-aluminosilicate potential in the pegmatite field (Trueman and Černý, 1982).

Unknown pegmatite minerals

Several minerals found in the pegmatites are still to be identified. However, they occur in extremely small quantities and they may only be significant as geochemical indicators, if at all.

Tourmaline

Tourmaline occurrences in the pegmatites (internally and in metasomatic exocontacts) are extremely limited. However, tourmaline bordering some of the quartz veins can be excavated as collectible and souvenir stock.

Quartz

Only a very limited supply of vug-lining quartz crystals is indicated at Camp Alex and Garnet Point but the reserves on Glass Island may be rather extensive. Collectible specimens, souvenir-grade material, and quartz crystals for enhancement of soapstone carvings should be available in abundance.

Andalusite

There is a virtually unlimited supply of chiastolite north and northeast of Garnet Point, in a 10 m wide layer of metapelites (Fig. 27-29, 33-35). Individual crystals are on the average about 1.5 x 6 cm but are commonly larger, reaching 2.5 x 25 cm. They represent good collectible material (particularly where associated with, or enclosing staurolite), and souvenir stock for cut-and-polished tablets.

SUMMARY

No economically feasible accumulations of pegmatitic ore minerals were found, although the accessory mineralogy indicates a potential for beryl and possible presence of Li-aluminosilicates.

Beryl and garnet in the pegmatites can be extracted, by aid of surface blasting, as collectible and souvenir stock.

Tourmaline from the quartz veins can be similarly obtained for collector and souvenir trade.

Quartz has considerable potential on Glass Island.

Andalusite and garnet in schists at Garnet Point can be worked for collectibles and cut-and-polished tablets for souvenirs.

It should be noted that the appeal of collectibles will be in their "exotic" provenance, rather than the quality of the material which is rather run-of-the-mill (with the exception of the very best possible chiastolite specimens).

Souvenir material should be attractive, all the more that (to the best of our knowledge) rocks and minerals have not yet been offered in the western Canadian arctic and subarctic.

RECOMMENDATIONS

As a fundamental basis for further geological work, detailed air photographs are essential for the three claims and other areas of interest, at a scale of about 1:5000.

Geological studies

Pegmatite populations of both Barclay and Chantrey belts should be examined, as the mineralogy of the pegmatitic leucogranites and pegmatites in the Ml claim indicates a potential for Be, Nb-Ta and Li deposits.

Detailed study of metamorphic grades and gradients should be conducted to aid in pegmatite prospecting (Trueman and Černý, 1982).

Structural statistical study of the quartz vein distribution and attitude should be conducted on the Qulik 1 claim, in correlation with the occurrences of crystal-lined cavities, to develop exploration criteria for cavity location.

The quartzite unit containing crystal-bearing cavities should be examined in its mainland continuation to the northeast of Glass Island.

Feasibility studies

Techniques for liberation of the metamorphic minerals, pegmatite minerals and quartz veins in the field should be developed.

Experimental excavation, cutting and polishing of the garnet- and chiastolite-bearing rocks should be initiated, to establish a practical procedure for systematic production.

Production cost of the above should be correlated with market potential.

A market study should be conducted for the collectibles and souvenirs - beryl, garnet, tourmaline, quartz crystals, and uncut andalusite and garnet.

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P. CERNY SAMPSITE DATA

S/NO	CSITE1-A	CSITE1-B	CBGR-1	CIGR-3
SIO2	73.50	68.92	76.52	73.63
TIO2	0.01	0.36	0.07	0.01
AL2O3	13.19	15.01	12.68	14.76
FETOT	0.48	3.16	0.88	0.59
MNO	0.03	0.05	0.05	0.02
MGO	0.01	1.18	0.01	0.01
CAO	0.54	2.25	0.52	0.86
NA2O	3.84	3.60	3.77	4.25
K2O	5.32	3.79	4.90	3.75
P2O5	0.10	0.11	0.01	0.17
TOTAL	99.02	98.43	99.41	98.05
LOI	0.50	1.17	0.36	0.67
SUM	99.52	99.60	99.77	98.72

S/NO	CSITE1-A	CSITE1-B	CBGR-1	CIGR-3
TRACE ELEMENTS				
CU				
NI				
ZN				
CO				
U				
PB				
TH				
Y	2	6	29	11
ZR	14	154	79	23
NB	DL	5	20	10
RB	128	114	210	213
SR	41	391	27	43
F				
H2O-				
H2O+				
CO2				

DL: BELOW DETECTION LIMIT - 2 PPM

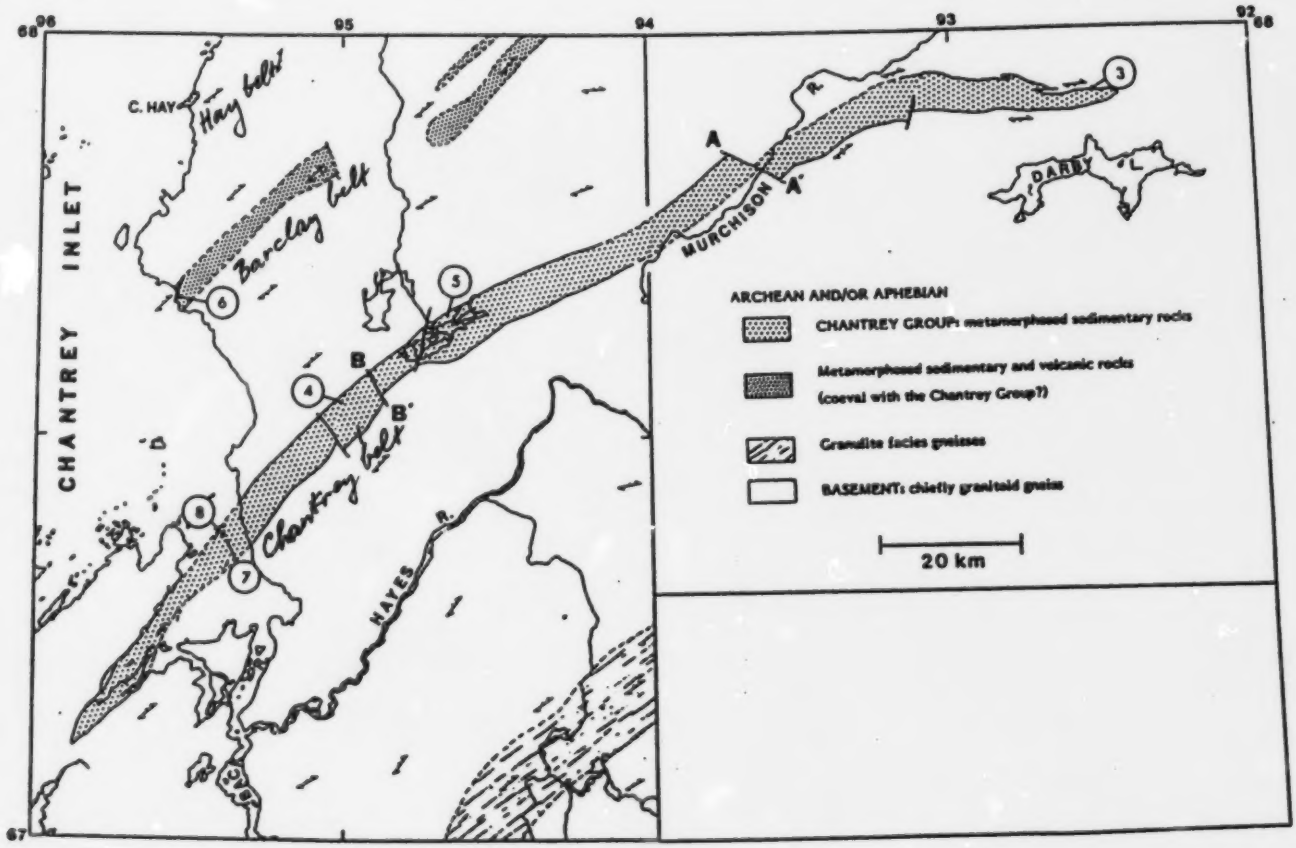

Fig. 47. Regional geology of the eastern side of Chantrey Inlet (from Fritsch et al. 1984).

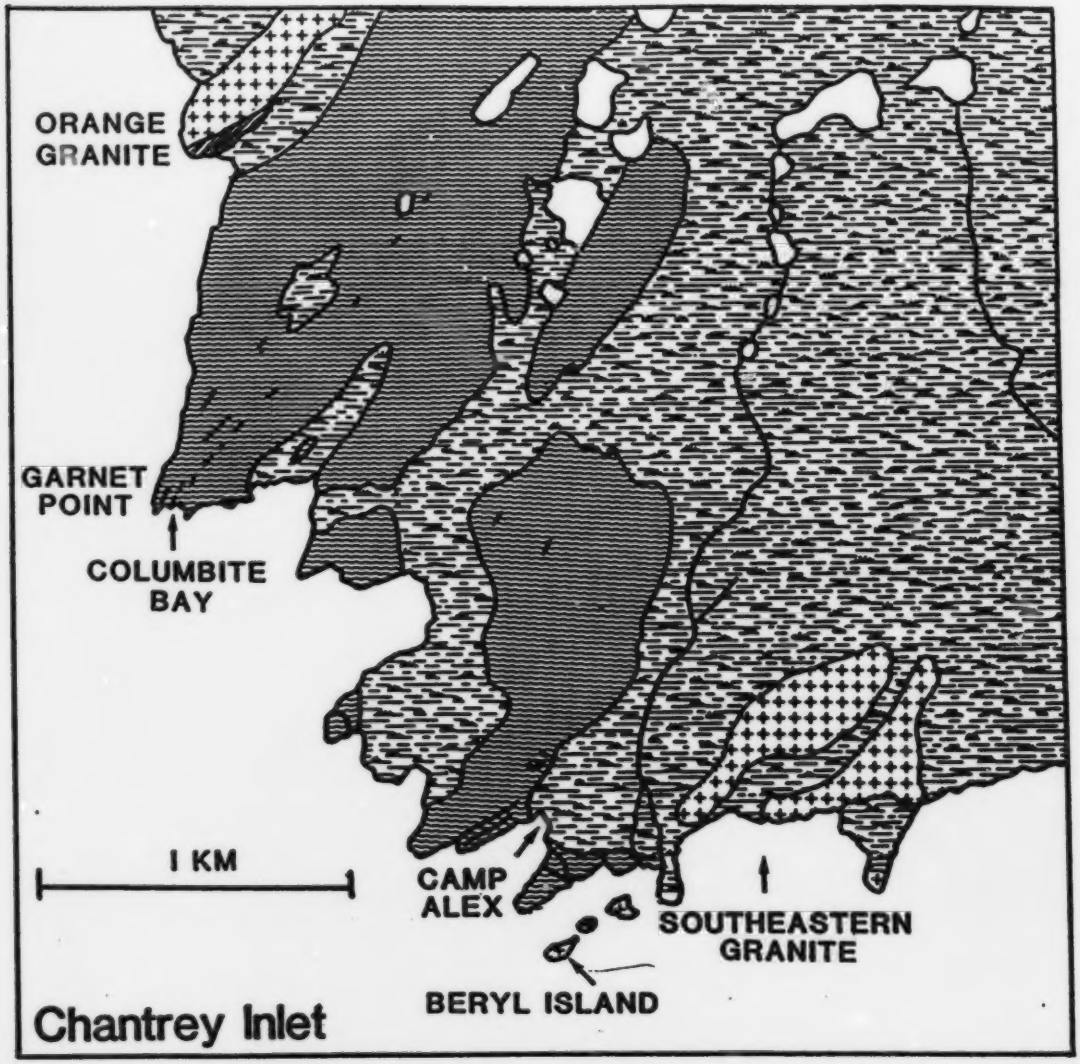

Fig. 48. Schematic geology of the Barclay greenstone belt in the area of M1 and M2 claims. Wavy pattern - metasediments and metavolcanics; NE ruling - micaschist; solid lines - pegmatites.

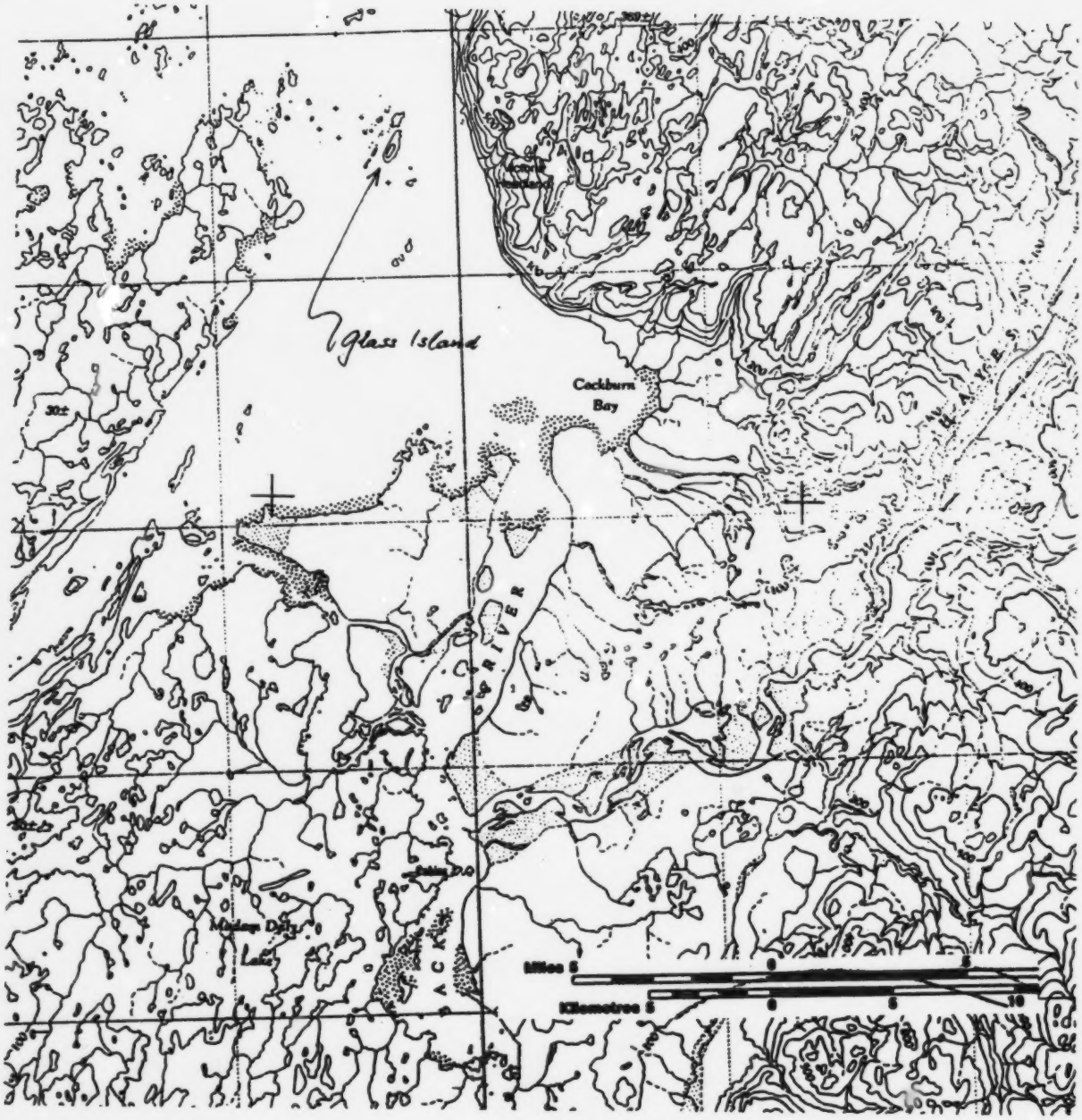

Fig.49. Location of Glass Island in the southern part of Chantrey Inlet (Cape Barclay sheet, 1;250,000).